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Tree-planting.

THE operation of planting trees requires deliberation and care. It should be done thoroughly or not done at all. Economy in tree planting means the proper preparation of the ground to be planted, and the use of well selected and well grown trees. The insufficient preparation of the soil and the use of badly-grown and badly-rooted plants is extravagant and wasteful, because such a course must invariably fail to produce satisfactory results. William Cobbet, who more than sixty years ago wrote what still remains the best book on planting which exists in the English language, exclaims, in speaking of the necessity of a thorough preparation of the soil, "How many millions have been *thrown away* in planting! How many thousands of plantations have, at the end of twenty or fifty years, made a beggarly exhibition; and how many of them have wholly failed! Yet, no truth is more evident to my mind than this: that no plantation ever failed, except from the manifest error of the proprietor. It is worse than useless to plant, unless you do the *whole thing well;* because, instead of creating a source of profit and of pleasure, you create a source of loss and mortification."

Trees may be planted in this latitude in spring or in autumn; in more northern parts of the country they can be safely planted only in spring. Whether they are planted in spring or in autumn the ground should be prepared in advance. This should be done for spring planting the year before. This will give time to the soil to settle and become pulverized, and it will enable the planter to consider carefully what trees he will plant and just where he wants to set them. These are questions which should not be left unsettled until the short planting season arrives. The composition of an ornamental plantation—that is, the proper grouping together of different varieties of trees in a harmonious arrangement—requires much consideration and study. Satisfactory results will never be obtained if the arrangement of a plantation is left until the trees arrive on the ground. The proper preparation of the soil is the foundation of good planting. The best results will be attained by trenching by hand the area to be planted to a depth of two feet. The ground in this way is thoroughly broken up and loosened and the roots of the trees can extend freely in all directions. Care must be taken in trenching to keep all the surface soil on top and not to mix it with the subsoil. Hand trenching is a slow and expensive operation, and few people will undertake it on a large scale in this country. When the ground is not trenched a hole must be dug for each tree. The larger and deeper they are made, the better the trees will grow. Holes twenty feet across and three feet deep are not too large, if large, long-lived and healthy trees are expected. It is impossible to provide too much healthy nourishment for a tree. Small and shallow holes mean small, stunted and short-lived trees. All holes for spring planting should be dug during the previous autumn. As soon as dug the loam should be put back in the holes, and if the land is gravelly or rocky the poor soil should be replaced by loam or peat carefully mixed through it. Peat furnishes valuable food to trees, and almost all varieties enjoy a liberal supply of it. The soil will be thoroughly settled in the holes by spring and all ready for planting, and the small, shallow hole actually necessary to receive the roots can be made then easily and quickly in the prepared soil.

It is always better to plant small trees than large ones. They are more easily and cheaply moved, recover sooner and grow more rapidly. A transplanted tree two or three feet high will soon overtake and surpass a much larger one, and will grow into a more vigorous and beautiful specimen. A vast amount of money and a great deal of time is wasted every year in trying to transplant large trees.

It is not essential in digging up trees to preserve a large ball of earth about the roots. A very heavy mass of earth often breaks the tender roots, and is, therefore, a danger rather than an advantage to the tree. It is essential, however, to preserve as many of the small feeding roots as possible, and care must be taken in digging a tree not to unnecessarily break or mutilate them. All broken roots should be carefully cut away with a sharp knife before the tree is replanted. Care must be taken not to expose the roots to the drying influence of the sun and wind. They should be covered as soon as the tree is dug with a piece of cloth or matting, or they may be dipped in wet mud until they become thoroughly coated. The secret of successful transplanting is to have the soil brought into close and immediate contact with the roots. It is better, therefore, to plant in dry, and not in wet, rainy weather. The coating of mud not only protects the roots from drying, but helps the earth thrown about them to adhere more closely. Two men are required to plant a tree. The hole should be twice the width of the mass of roots, and the bottom should be worked fine with a spade. One man should then hold the tree erect, with its roots carefully spread out in all directions in the hole, while the second man should break the soil taken from the hole, so as to make it as fine as possible, and then let it fall from the spade down upon the roots, while the first man should lift the tree gently up and down that the fine earth may penetrate and fill all cavities about the roots. When the hole is nearly filled in this way the earth should be pressed down with the foot, beginning at the outside of the hole and working in towards the stem of the tree. The hole may then be filled and the soil rammed down solid. Tall trees should be carefully and securely staked as soon as planted. The operation is then finished. It is not uncommon to see water poured into the hole while it is being filled up. This practice does harm rather than good, as it washes the fine soil away from close contact with the roots.

Some planters recommend transplanting coniferous trees during the month of August, but this plan has little to recommend it; and it is certainly safer to move them in the spring. Many people believe, too, that they can only be safely moved late or after they have begun their annual

growth. This is a mistake. Conifers can be safely transplanted just as soon as the soil is dry and friable. They can, however, be moved later than deciduous trees, as they begin to grow later.

These are the general rules for successful tree-planting. Certain families or species sometimes require special treatment. Magnolias should be moved late, and after their roots are in active operation, which is shown by the unfolding of the leaf buds. Walnuts and Hickories, as they have strong, deep tap-roots, should, if they are to grow into fine trees, be planted when very small. Seedlings two or three years old, when finally transplanted, make the best trees. All the Oaks make better trees when permanently planted young. This is true of all the White Oaks. Some of the Black Oaks, however, especially the Red Oak and the Water Oak, can be safely transplanted, if they have been properly grown in nurseries, when they are ten or twelve feet high. Shallow rooting trees, like the Maples, Lindens and Elms, may be moved, with proper precautions, after they have reached a considerable size and age. Small specimens, even of these trees, move better, however, and in the end give better results and more satisfaction.

The man who plants one good tree thoroughly well, and then takes care of it after it is planted, does more for himself and the community in which he lives, than the man who sets a hundred, badly selected and badly planted, or who neglects his trees after he has planted them.

An American School of Forestry.

An article on another page of this paper gives an example of the close measurements and calculation that are made by expert foresters in countries where every bundle of faggots is taken into account in estimates of forest production. Under such conditions the theory and practice of forestry are brought to a mathematical basis, and the business of the forester not only embraces the art of growing trees and forests, and of utilizing and disposing of wood products, but it necessitates accurate financial calculation, so that the largest possible production may be made with the smallest outlay. The accomplished forester in Germany must be a financier as well as a mathematician, for, practically, he has the handling of large capital invested in wood production. And since the margins are narrow, the time over which the operations extend long and the factors which enter into the calculation variable and uncertain, there must be frequent measurement and constant adjustment and readjustment of the elements of the problem.

It is plain that America offers no field for those refinements of forest practice. So long as there are vast areas where wood can be had for the chopping there will be no call for experts to estimate laboriously the exact amount of increase on a given area of woodland in a year or in a decade. This does not imply that no system of forestry is possible in the United States, but that for the present, at least, it must be a different system. What is known as "intensive farming" would be folly on a western prairie, but agriculture is profitable there, nevertheless, when conducted in a cruder way, or on the only system practicable under the circumstances. The time may come, as a closer husbanding of natural resources is demanded on what are now cheap lands, when every rood of farm land will become as productive as a garden spot. In like manner the time may come when the same care will be given to the details of forest management here that is devoted to them in Germany to-day, and until some progress is made in that direction there is no encouragement here for a young man to study forestry. This is one calling for which no opportunity or opening presents itself in the United States. Nowhere in the whole country is there assured employment for a single trained forester.

Of course no skilled foresters will appear until there is a demand for their services, and there is but one source from which that demand is likely to come for some time, at least. In spite of the unchecked spoliation of our public timber lands, the Government still owns vast forest tracts, situated largely at the sources of our most important rivers. It is true that our national forest policy, so far as any settled policy exists, seems to have been framed for the encouragement of fraud and depredation. But it must be assumed that an awakened and instructed public sentiment will soon force Congress to make some honest effort for the preservation of the public forests. With the effort will come the need of guards and inspectors, whose duties at first will be to protect the timber from fire and thieves and devastating animals. Even an unskilled patrol, if free from political favoritism, and efficiently organized, would save for the country every year many times its cost. But it would soon be evident that for a reasonably successful forest administration, the service, and especially its higher executive positions, would need officers with a special training.

For this purpose, if the highest efficiency were desired, an American school of forestry would alone suffice. There are laws of plant growth and principles of forest management which hold good the world over. But even from a cultural point of view the American forester would need to be learned in American forest-botany and familiar with the modifications of general practice which our climatic peculiarities necessitate. Besides this, he should be familiar with our business usages and our habits of thought in political matters. Years must elapse before a corps of teachers can be gathered and students graduated. And why should such a school attract students, so long as years of thorough training give no assurance of employment?

In a paper read before the Massachusetts State Board of Agriculture last winter it was suggested by Mr. John Robinson that a United States School of Forestry should be organized and conducted on precisely the same principles as the United States Military Academy. Students should receive an allowance from Government just as the Cadets at West Point do. The course should be thorough, extending over a period of from five to eight years, and a permanent appointment in the Forest Service, with opportunity for promotion, should be given to each graduate. In no other way, so far as we know, can young men of intelligence and ambition be induced to devote themselves to the study of forestry as a profession. An assured and honorable position for life ought to prove an adequate attraction. And in no way can the Government be as certain of a Forest Service of a guaranteed quality and with a proper *esprit de corps* as when it educates its own officials and has the power to prescribe examinations for a commission as rigid as those at West Point.

Easter Flowers in New York.

A FEW years ago our churches were decorated at Easter with great numbers of "made pieces"—crosses chiefly—often of very large size; and their display in the shops on Saturdays attracted crowds of gazers. Now such pieces are scarcely ever ordered. The churches are decorated with growing flowers set against a background of palms, and with quantities of Sm lax and other vines. The fact certainly shows an improvement in taste; and it is also pleasant to note that Easter flowers are no longer sent to the churches only, but are very common as gifts to friends.

The sale was apparently large this year, but the flowers and plants themselves were by no means so good as in some former seasons. The florists explain this fact, however, by reference to the early date upon which the festival fell and the dark skies which have ruled for the past few weeks. The best things to be seen were, perhaps, the Lilies, which appeared in great quantities and in several

varieties—the finest being the tall, white Japan Lily. The florists' habit of removing the anthers from Lilies as soon as the buds open does indeed preserve the purity of the petals; but this gain is somewhat dearly purchased by the lack of their yellow accents when the flower unfolds. Next to the Lilies should be named the Canary Broom, which was grown—and very well grown—in much larger quantities than ever before. Acacias were also for sale, but not in large number. In two or three shops there was a comparative novelty in the shape of great sprays of purple Bourgainvillea. The European Bladder-Nut—a shrub with white flowers—had also not been so often seen in previous years. Lilacs were poor—nor are they ever so good in this country at this season as in Paris, where they are so admirably and profusely forced. Hydrangeas, on the other hand, were excellent and seemed to contest with Lilies the first place in popular favor. Azaleas were very poor—usually both small and badly grown. Spiræas and Deutzias were fairly good. In one shop at least there were a number of Mahernias, not very attractive to look at, but of delicious odor. Orchids, both cut and growing, were conspicuous, and in some cases very good. Daffodils could be had in quantities—not of the first quality—but no other variety of Narcissus. Lilies-of-the-Valley and Mignonette were abundant and excellent, Carnations abundant but not fine, and Roses by no means up to the standard of former years. Smilax was everywhere in quantities and excellent in quality.

Dangers threaten the Adirondack forests from every direction. On the 20th of March Mr. Hadley introduced into the Assembly, and, by the unanimous consent of that body, passed to a third reading, a bill authorizing the Commissioners of the Land Office to release and convey to Charles W. Durant, Jr., a tract of land on Racquette Lake one hundred and sixty acres in extent. This piece of land contains some of the most beautiful building sites in all the North Woods, and has a large market value. Mr. Durant entered and took possession of the land, and, without right or title to it, erected permanent, and, probably, expensive improvements, "in contemplation of purchase," the bill explains. Mr. Hadley's bill should be defeated, and Mr. Durant and every other person unlawfully occupying State forest-lands should be compelled to vacate them forthwith. The tract of land which Mr. Durant seeks to obtain by this piece of special legislation is situated within the forest-preserve. The forest-preserve was created and is maintained to protect the rivers and regulate the sanitary conditions of this State, and not to supply homes to wealthy citizens who may take a fancy to pass a few weeks in the woods during the summer months. We have already pointed out in an earlier issue the dangers that menace the forests through the probable enactment of a law giving the Forest Commission authority to lease parts of the preserve for building purposes. The fact that a bill authorizing the sale of a part of the forest to Mr. Durant can be hurried to a third reading in the Assembly without exciting public attention and alarm, shows how great the danger of giving such remarkable and unusual powers to the Commissioners really is. Every one who takes a lease of a piece of land in the forest and makes improvements on it, and then becomes dissatisfied with the terms of his lease, or is unable to renew it, or takes a fancy to own the land upon which he has built, will go to the Legislature to get authority to buy. And in nine cases out of ten the application, if it is backed with sufficient money, or political influence, or social standing, will succeed.

The Forest Commissioners are opposed, it is reported, to the passage of the Durant bill, although it is not apparent that they have taken any very active steps to defeat it or to warn the public of this new danger to the forests. Indeed, the favorite measure of the Commissioners, authorizing the lease of State lands for a term of years and with privilege of renewal, practically empowers them to do for a thousand squatters what this bill does for one.

Landscape Gardening as a Profession.

MUCH has been written of late with regard to the opening for young men of ability and taste in landscape gardening. While it is true that the need exists for men of artistic taste and skill in this profession, it is not so clear that there is sufficient encouragement for such men to enter it. The greatest need is for the education of public taste in garden matters, so that the demand for men of trained hand and a correct knowledge of beautiful forms and combinations of flower, shrub and tree may be created. So long as the public are satisfied with parks constructed by engineers, and with terraces and embankments like those of railways or fortifications, and are content to have their private grounds filled with meaningless "sarpentine" walks, by some Irish laborer; so long as the denizens of our cities give annual employment to a crowd of peripatetic tree-butchers in lopping off the heads of beautiful trees, just so long will men of taste avoid a profession in which they would starve, while the ignorant pretender and the mathematical park-maker waxed fat. In one of our large Atlantic cities, a recently founded public institution stands at the junction of two wide avenues with ample grounds and grand old trees. The grounds were beautiful and natural before the erection of the institution, but it was thought necessary to "improve" them. And the improver went to work with transit and level, spade, pick and shovel, and he terraced the place on all its public sides with banks one above the other in diminishing perspective, building stone walls around trees from which he dug the earth, until now quite a respectable fort appears, and the passer-by involuntarily looks for the barbette guns on top. And yet the public think it beautiful, and the newspaper men praise the ingenuity in saving the trees. In all our wide and wealthy land the men of true skill in landscape art who meet with encouragement in their profession, can be almost counted on the fingers of one hand, while railroad engineers, architects and hod-carriers are the landscape gardeners for the masses. Political favoritism also operates largely against true landscape art. No matter how correctly some public ground may be designed by its projector, the mutations of politics surely bring in some pig-headed fellows, who either prevent the design being completed, or let some ignoramus spoil it. One has only to go to the public grounds in Washington to see plenty of such examples. The work of A. J. Downing is being allowed to grow into a jungle because no one has had backbone enough to cut away trees which Downing planted as "nurse" trees, while his design was growing. And in the grounds of the Agricultural Department, well laid out originally, and planted as an arboretum, a straight avenue of asphalt has been cut through the original design, and bordered by two lines of wretched Ginkgo trees, looking like foreign tramps in rags and tatters on dress-parade. So long as public taste demands that every little spot of greenery must have all the repose driven out of it by obtrusive beds of Coleus and Geraniums, and the construction of carpet-beds is considered the highest style of garden art, it will be hard to get young men of education and taste to enter into competition with the crowd which suffices for the public demand. Of course, there are exceptions to all this, for we have some good landscape gardeners, and some men who are employing them, but I fear that the few who do really good work can easily do all the good work called for.

HORTICOLA.

["Horticola" is certainly justified in feeling discontented and even indignant with the present condition in our country of public taste in regard to landscape gardening. It is only too true that natural beauty is often desecrated and existent works of landscape art destroyed by ignorant remodeling, and that the engineer on the one hand or the laborer on the other, is often intrusted with work which demands an artist's eye and touch. We believe, however, that there has recently been an awakening of intelligent public interest in the subject. The fact seems

proved by many other signs as well as by those recently published articles in popular periodicals, referred to by "Horticola," which have stated our need for more professors of the art. The laws of supply and demand are not always easily followed in their working. It is hard to be sure whether "Horticola" is right in believing that so much gardening work in America is bad because we do not appreciate good work, or whether we are right in believing that it is bad largely because enough men cannot be found to do it well. Yet some evidence of the correctness of our belief would appear, we think, if the three or four most prominent landscape gardeners of the country were questioned with regard to their experience during the last ten years; we think they would unite in saying that they are much more busy to-day than they were ten years ago, and that their clients show a more intelligent interest in their labors. We think also that they would recommend their profession as a good one for young men to enter, who are willing to study it thoroughly and are possessed of the energy and enthusiasm necessary to win success in a career which demands practical common-sense united to artistic feeling; for, even though the demand for the services of such men is not nearly so great at this moment as it ought to be, yet by the time a student now commencing his education is ready to begin independent practice, it certainly will be much greater. Of this we feel sure, not only from indices found in the most recent history of the art of landscape gardening itself, but from the records of the development, during the past two decades, of American art in other directions and particularly in the direction of architecture.—Ed.]

A Temple in Japan.

THE love of the Japanese for nature and their skill in horticulture are well known. But the high level of their attainments in the art of landscape gardening is, perhaps, less generally understood. From the witness of many travelers it seems to be indisputable that no other people has ever approached this art in so artistic a spirit, has so well known how to improve without disturbing the beauties of nature, or has so persistently and universally put such knowledge to use. Formal gardening effects are never desired in Japan —a fact which might be anticipated by any one who has studied Japanese art in any of its branches, since its very essence is a dislike for formality and symmetry, a love for the utmost variety in detail which can consist with unity of general effect. Japanese art in landscape gardening is pre-eminently the art which conceals art. Every foot of the ground in the more closely populated districts has been carefully tended and treated for many generations, yet there are few spots in which the traveler can decide how much is due to nature's work, how much to man's. Trees and shrubs and flowers, water, and even rocks are sedulously tended with an eye to the production of the highest possible degree of beauty, yet always in such a way that beauty shall seem to have come of itself. Even in the immediate neighborhood of Japanese buildings the same ideal is preserved, and as the architecture, compared with that of occidental countries, is of an unambitious kind, and as the material used for it is wood, the effect is always what we would call a rural, a picturesque effect.

The illustration of a Japanese temple herewith given may serve to give an idea of Japanese architecture in combination with landscape. The temple is placed so that those who visit it have an unobstructed view of the sea and of the beautiful line which the shore makes towards the right, while the precincts themselves are agreeably shaded by large trees, beneath which grass and flowering plants grow in natural profusion. It is needless to point out how picturesque, yet harmonious and graceful, are the forms of the trees—forms not more beautiful in themselves than appropriate as making a delicate frame for the distant stretch of sea. As has been said, it is impossible in Japan to tell in how far any beauty is due to nature, in how far to man. But we may safely conclude that the forms of these trees are not altogether natural —that they have been watched and directed year by year until the most desirable effect was produced and then carefully preserved in that effect. We may even feel sure that the round-headed tree in the far distance would not stand where it does had it not been felt that its presence was fortunate as accenting the projection of the shore. Color always aids form in producing beauty in Japan. The temple here is painted red and has a roof of yellow thatch, and these tones, in contrast with the dark green of the surrounding trees and the brilliant blue of the sea, must give the spot extraordinary beauty.

Such a picture as this is well worth careful study by those who are meaning to build on the pine-grown coasts of New England. Scenes, the natural beauty of which is closely akin to the beauty of this temple-site, are very frequent there, and the utmost effort should be made by architects and owners, to preserve their charm, to build in such a way that the work of architecture will complete instead of hurting it.

Spring in Mobile.

IT was no later than the middle of February when the red and purple of Verbenas, Drummond's Phlox and Pansies brightened the beds where white Alyssums, Candytufts and Narcissus had already been blooming. Of woody plants the Chinese Cunninghamia, the purple Magnolia, the Laurestinus and the Mahonias were blooming early in the month, followed soon by the Mock Orange and Red-bud from more northern woods, and the Chicasa Plum, whose true home is probably two degrees further north and on the western bank of the Mississippi.

Towards the last days of the month the Loblolly Pine, the Liquidambar, the Hornbean, and the Sweet-leaf (*Symplocos tinctoria*), one of the prettiest amongst the small evergreen trees of the South, were in bloom. The flowering of the Witch-hazel at this season is worthy of note. Clusters of apetalous, staminate flowers make their appearance in the axils of the leaf buds while still in their winter sleep. Not a single perfect flower was observed, which cover the branches late in the fall with their strap-shaped petals.

In the garden, the Banksian and Marechal Niel heralded the season of Roses by blooming in the first week of March. The dwarf Almond, and the interesting Texan Buckeye (*Ungnadia speciosa*), were by the 12th covered with flowers, while the Hybrid Rhododendrons in many varieties displayed their resplendent shades of purple and red. Azaleas, Rhododendrons and Kalmias were blooming in the forests by the middle of the month, and the swamps were brightened by the flowers of Wax Myrtle, of Andromeda and of the Parsley Haw.

Not to name a score of beautiful herbaceous plants and small trees blooming in the Pine-openings, I cannot pass by the southern Sloe (*Prunus umbellata*). This is one of our most striking trees, and its value for the adornment of park and lawn is not appreciated. At its full growth the trunk is from 8 to 10 inches in diameter, and the tree attains a height of over twenty feet. The massive limbs spread horizontally at a distance varying from 3 to 6 feet above the ground, producing numerous erectly spreading branches, which divide into a mass of densely crowded spiny branchlets, forming a dome-shaped head often over twenty-five feet through. In its season this is covered with snow-white flowers, which are succeeded by dense green foliage. The fruit is of the size of a cherry, deep purplish-blue in color, and used for making an excellent conserve.

Almost all of the ament bearing trees found in this section are now blooming. The Beech, the Cottonwoods, the Black Willow, the Swamp Ash and all the Oaks of the upland and lowland, are unfolding their foliage, while on our porches the Wistaria and Trumpet Honeysuckle are loaded with flowers.

March 26th, 1888. *Karl Mohr.*

Foreign Correspondence.

London Letter.

ON March 13th the Royal Horticultural Society met for the last time in its old home, so long identified with the history of English Horticulture, and the occasion brought together a large gathering and an interesting exhibition.

Among the new things exhibited but few were officially approved. The most important plant to receive a first-class certificate was a newly introduced Bladderwort (*Utricularia rhyterophylla*), which will prove valuable for a stove or Orchid-house. In growth it resembles the white *U. montana* and the mauve-tinted *U. Endresii*, the leaves being long and narrow, but the flower spike is taller and more erect. The flowers, in shape so much like an Orchid as to deceive many persons, have

two petals, the broad one resembling a lip about an inch wide. The color is a bright purple, intensified by the rich blotch of orange yellow on the lip. It is a plant of singular beauty, and those who love Orchids must admire this Bladderwort. Fortunately it requires the same treatment as many Orchids, being best grown in a suspended basket in an intermediate house. It is a native of tropical South America. Sir Trevor Lawrence showed the specimen.

A new single white Violet, called The Bride, exhibited by James Veitch & Sons, also won a certificate. It flowers profusely, small plants showing masses of pure white and fragrant bloom. The large and abundant foliage indicates a plant of strong growth and of good promise for market purposes.

A modest little Rock-Saxifrage, with cushions of primrose yellow flowers, won the third certificate. It was named *S. Frederici-Augusti*, but it may prove identical with or a form of *S. luteo-purpurea*. It is a charming little plant for an open rock garden, as it flowers profusely in defiance of frosts and snow, and so does *S. Burseriana*, which was shown beautifully by the same exhibitors, Paul & Son, of Cheshunt. Among other exhibits not certificated there was the new Rose, Lady Alice, a paler flowered sort than Lady Mary Fitzwilliam, one of Bennett's seedlings, from which it is a sport. The flowers are more globular, and the tint is a delicate blush, just a shade away from white. It is extremely floriferous; so much so, indeed, that, like its relative, it does not make growth enough for the nurserymen. Mr. Paul tells me that the plants he showed, a dozen in number, all with several fine flowers, were from a lot taken into a slightly heated house in December, where, for the past six weeks, they have been supplying cut blooms. A miniature Rose, called Red Pet, also new, was also exhibited from Cheshunt. The flowers are small, but abundant, and the color, a rosy crimson, is bright. Being very dwarf, it is well adapted for pots in the green-house in spring.

Among a group of plants from Veitch's nursery were three indispensable kinds for the green-house in March. One was the Rhododendron Early Gem, a hybrid from the early flowering *R. Dauricum*, but very much superior in every way. The plants shown were only about a foot high, but were smothered with bloom, each flower being two inches across and of a rich violet purple. It has been known here for some years and is popular among gardeners, as it requires but little or no forcing, and a group of a dozen plants makes a fine effect.

Another early shrub was *Azalea altaclerensis*, an old variety raised at Highclere, the Earl of Carnarvon's estate in Berkshire, famous for the Rhododendrons and other hybrids raised a generation ago. This Azalea is similar to the well-known *A. Pontica*. The flowers are large, of a bright clear yellow borne in large clusters, and rendered most effective by the tender green of the new foliage. The third is the new *Boronia heterophylla*, a native of Australia, one of the so-called New Holland plants. The plant most nearly resembling it is *B. elatior*, but this novelty is finer in every respect. The growth is slender, yet bushy; the flowers, like tiny bells, are of a brilliant carmine-crimson and hang on the erect branches so thickly as to obscure the narrow leaves. I consider it one of the finest green-house plants introduced for many years. If hard-wooded green-house plants find much favor in the United States, this should be remembered as one worth having.

A Temple in Japan.

Among the Orchids the most remarkable were the following: *Phajus tuberculosus superbus*, a truly superb variety, having larger flowers than those of the species and with broader and whiter sepals and a more richly colored lip. The new *Angræcum Sanderianum* was shown to perfection by Sir Trevor Lawrence, the plant having four spikes nearly a foot long of snow-white flowers, showing how wonderfully free it is in flowering. But the finest Orchid in the show was *Cyrtopodium Saintlegerianum*, which much resembles the old plant named by Lindley *C. punctatum*. It bears a huge branched panicle of flowers, each

one and a half inches across, with yellow sepals and petals, heavily barred with brownish red and a lip of the same color but of a richer tint. It is extremely showy, and, I am told, is not a difficult plant to manage in an intermediate house. It was introduced from Brazil a few years ago by Horsman & Co. through a collector named St. Leger. There were numbers of other Orchids shown, including, of course, many new hybrid Cypripediums, for novelties in Lady's Slipper Orchids come nowadays as frequently as new Pelargoniums formerly did. Some of them might well be classed as Orchid rubbish, but quite worthy of notice was a specimen of *Dendrobium Wardianum*, fully four feet high by two and a half feet across, with each stout stem completely wreathed with bloom. Every Orchid grower knows that such a specimen requires a deal of skill to grow it, and a cultural commendation was justly accorded to the exhibitor. *Wm. Goldring.*

New or Little Known Plants.

Cypripedium fasciculatum.*

WE have had occasion already to refer to the difference which often exists between the eastern and western representatives of the same genus. In *Cypripedium* we have another instance of the same kind, and one which tends to illustrate also how in some measure the flora of northern Europe and Asia and that of eastern North America including Mexico are more nearly related to each other than either is to the flora of California and the Pacific coast. All are familiar with our common eastern Lady's Slippers, which have for the most part leafy stems bearing one or two or rarely three flowers with a conspicuous and usually large white or purplish or bright yellow lip. None of these range as far west as the Rocky Mountains, in which, as in the broad interior region beyond, within the limits of the United States no species of the genus is found. The several Mexican species are of the same general character, with large flowers, as are also those of the temperate region of Europe and Asia.

On the Pacific coast there are four species, one of which is here figured. This, it will be noticed, is peculiar in its single pair of cauline leaves, and in its very small greenish flowers, which are usually several in number and somewhat clustered at the top of the stem. In its foliage it resembles the subarctic *C. guttatum* of Alaska and northeastern Siberia, which, however, has but a single and a rather larger flower. *C. fasciculatum* is found in the Cascade Mountains of Washington Territory and southward in the mountains to Lassen's Peak in California. Its lip is less than half an inch long, and the sepals and petals are not greatly longer. *C. Californicum*, of which a figure will be given in a future number, has a leafy stem with small flowers solitary in the axils of several of the upper leaves, and the greenish yellow sepals shorter than the lip. The remaining species, *C. montanum*, comes nearer to its eastern relatives in its long brownish sepals and petals, but the lip is small and the flowers are peculiar in being very fragrant. *S. W.*

Fig. 16.—Cypripedium fasciculatum.

Aquilegia longissima.

REFERRING to the illustration and description of this Columbine, p. 31, let me say a word about it as a garden plant: It "was found first by Dr. Palmer in August, 1880, in the Caracol Mountains, 21 miles southeast of Monclova, in the State of Coahiula."

Dr. Palmer secured herbarium specimens and seeds for the Botanic Garden, Harvard College. The seeds were given to me, and from them in the spring of 1881 I raised a few good plants; some of these were distributed among our correspondents at home and in Europe. During the first year the plants were grown in a cold-frame. In the spring of 1882, leaving two plants in the frame, I set out the others in the rockery. All of them bloomed the following summer, coming into bloom about the end of July and continuing in flower till the end of September. A few were sent to correspondents, the others were wintered where they had been growing all summer; those in the rockery, having, in common with the other plants, a light mulching of tree leaves and sedge. In the following spring (1883) they were all alive and as healthy and fresh as *A. chrysantha* or any other species, and grew and

* C. FASCICULATUM, Kell.; Watson, Proc. Am. Acad. xvii. 380. Low (from 3 inches to a foot in height), the stem villous-pubescent and bearing a pair of ovate or broadly elliptical leaves; flowers one to four, approximate, shorter than the bracts; sepals and petals greenish, lanceolate, acuminate, six to ten lines long, the lower sepals united; lip depressed-ovate, four or five lines long, greenish-yellow with a brown-purple margin.

flowered the next summer in about the same style as they did the previous year.

It is a desirable garden plant because it is the latest blooming of all the known species, coming in when *A. chrysantha*, the next latest, is still in good flower, and continuing in blossom long after that species has ceased to bloom. It is less robust and less profuse than *A. chrysantha*, and its flowers are of a paler yellow shade and less showy. But its long slender spurs have a weird appearance and hang about the flower branches like strings of yellow Dodder. The spurs on the cultivated plants were from 3 to 6 inches in length and averaged about 4½ inches; indeed, they gave the impression that it was on account of their weight that the flowers "looked up" so much. None of the cultivated plants were ever known to produce any seed.

Since coming here I have been very anxious to obtain a plant of this strange Columbine, and with this end in view have sent to Cambridge, and also to all the correspondents to whom I had sent plants, and in all cases have been informed that the plants have died. It is now entirely lost to cultivation. But although in its native habitats "the known localities are not readily accessible," I hope we shall soon again have the pleasure of seeing it in our gardens.

In June, 1886, Dr. Asa Gray told me he had, two years before, given plants of it to Mrs. Pickering, of Harvard College Observatory, and that they had grown and flowered remarkably well with her. Mrs. Pickering is an enthusiastic and most successful grower of garden flowers and has a very select collection. I at once wrote to her, and she replied that her plants had died the previous winter. In a subsequent letter she gives me more particulars: "I tried one plant in the cold-frame, and transplanted the other in spring and fall. The one in the frame died first. The other was left out one winter and disappeared. The transplanted one did well for two summers, giving eight or ten flowers later than the other Columbines. The roots were so very long it was difficult to transplant it, but it did not seem to suffer materially in consequence. I liked the plant. The flowers were very showy in individual vases. But it was not as beautiful as *A. chrysantha*, the next in size, and which is to me the most beautiful of all the Columbines. I was sorry to fail with this Columbine, as I have never failed with Columbines before."

I feel assured that the plant is not very hardy, and should we get it again, it must be wintered in a frame. But if a perennial supply of seed be not obtained I fear we cannot keep it long after we do get it, for Columbines are not long-lived perennials, and propagation by means of division will be uncertain.

Glen Cove, Long Island. *Wm. Falconer.*

Cultural Department.

Small Fruits for Home Use.

THE Strawberry that will prove equally good on all soils, and under all conditions, has not yet been produced, and probably never will be. The same is true of other fruits, which accounts for the conflicting opinions as to the merits of the various kinds. If earliness, profuse bearing and acidity are desirable, the wants of the grower would be supplied by Crescent, May King and Manchester. If he requires quality with earliness, Cumberland would be better. If quality is more important than earliness, Downing, Prince, Belmont or Bidwell would answer. If size and beauty are wanted, Jewell will furnish these, and a good quality as well, and so will Jersey Queen, with a higher degree of acidity and flavor. If extra size, and sweetness without high flavor, are more desirable than heavy cropping, they can be found in Sharpless or Davis; and so the list might be varied *ad infinitum*. Numbers of new varieties are constantly being produced and tested, but time is required to determine their relative merits for general planting. Those named are the leading kinds of established reputation, and from them all reasonable requirements for home use can be fully met.

It is not advisable for the inexperienced to confine his planting to one or two sorts, a half dozen would cover the season better, and if one or more should fail from want of congenial soil or other cause, the others would be more likely to supply the deficiency.

As the Strawberry supply draws to a close the Black Cap Raspberry begins, the Souhegan being among the earliest and best. Possibly the new Carman may prove a formidable competitor—it certainly will if it maintains the promise it made in its original home. The Gregg is the largest of the Black Caps so far tried, as well as the latest. It is less juicy and more solid than the others named and the canes are not quite as hardy; otherwise Black Caps do not vary materially, and all are so seedy that they are often refused by persons of delicate organization, or perhaps disorganization is a better name for this weakness of digestion. The Shaffer is a dull purplish-red berry, of the Cap variety, of immense size, of fair quality and especially valuable for canning. It is the strongest grower of all and very productive. The Caroline, a salmon-yellow hybrid of the Cap and Antwerp, is a gem for family use. It is as early as Souhegan, and its delicate texture, fine flavor, immense productiveness and thorough hardiness make it a great favorite. The new Golden Queen may prove its equal, but it is difficult to imagine how it can be any better.

Of the red varieties the Early Prolific has always given me satisfaction for good size, earliness and productiveness; its quality is not of the best, but all earlier varieties are either too small, unproductive or inferior in quality. The Cuthbert is the most popular of the red varieties for home use; it is large, prolific and of good quality, of vigorous growth and suckers abundantly. The destruction of the superfluous plants in all of the red varieties is essential to the most satisfactory results. The Marlboro' and Montclair, though not so well known or widely disseminated, are quite as good for family use on soils adapted to their growth, being as large and sweeter in flavor. Here also adaptability to soil and freedom from disease must be considered. The various fungus-diseases attacking red Raspberries have not attracted the attention of mycologists to the extent they deserve, and we know little about them save their destructiveness.

Plants on rich soil and mulched in a dry time, are, I think, less liable to attacks of these fungi than those under opposite conditions. No two persons would agree on the same list of Raspberries, although the foregoing are the best of the most popular kinds for family use. The exacting amateur will demand the foreign sorts, which are not hardy in this climate without protection. *E. Williams.*

Montclair, N. J.

The Kitchen Garden.

HERE, on Long Island, about the middle of April, we are sowing and planting all the hardy vegetables and preparing our ground for the tenderer crops. I endeavor to have all empty ground cleared, manured and dug in fall to lessen the spring work. Crops do better than in land freshly manured in spring. It is not necessary to fork over light or sandy land, that lies high and dry, in spring. The surface should be raked smooth with a wooden rake, and then lined off for sowing seed or setting out plants. But heavy land, or even light land that has lain under water during winter, should be forked over. Never put a plow, spade or fork into heavy land till it is dry and mellow. I begin working our high, sandy land about the end of March, and our deep, level garden soil about the second week in April; but we have a springy piece of ground, which, although thrown up in ridges over winter, is not fit for the spade till the end of May.

The kitchen gardens on private grounds are generally laid out and cut up into squares in such a fashion as to render the use of the plow in them impracticable; indeed, old-country gardeners, as a rule, have a prejudice against the plow in the kitchen garden. But no spade or fork can prepare and pulverize soil for crops as well as can the plow and harrow. True, by hand power we can crop our gardens closer than by horse power, but the saving in labor and time is immense. While it would be well to have a garden where Chives, Parsley, Radishes, herbs for seasoning, and such miscellaneous little things of which we need only a small quantity at a time, could be grown, we should try to have our heavy crops, as Corn, Potatoes, Cauliflower, Tomatoes, Beans, Peas and the like, in an open area, where we could use horse power.

And in preparing ground a common digging fork does far better work than the spade, and with less effort, and for leveling and smoothing ground a wooden toothed rake is better than an iron one.

It is only the vegetable garden, but try for an air of neatness about it. See that the beds are square and the drills straight. Do not use up open ground for Spinach, Lettuces, Radishes or other crops that can be slipped in between larger ones. Do not have a lot of unused ground at any time; put in something, if only Lettuces, Cabbages or Beans, to feed to the animals. After Spinach, Beans, Peas, Beets or anything else becomes too old for culinary purposes, clear them away at once. Do not put in more of a crop at a time than you will need; it is useless labor and expense. And especially look to this in spring; it is not a large quantity of any one thing we

should put in, but rather a small quantity repeated in successional sowings. This is true of Peas, Beans, Corn, Beets, Turnips, Spinach, Lettuces, Radishes and some others. But of Onions, Potatoes, Artichokes, Asparagus, Parsley and others that readily suggest themselves, we should now get in a full crop.

Transplanting.—Contrary to advice usually given, transplanting garden plants should always be done in clear, pleasant weather. It is a great mistake to select a rainy day for this important work. Plants should not be taken up, either for transplanting into the garden or for potting for the window garden, when the ground is wet. It is better to do this work when the soil is reasonably dry, so that it will drop entirely from the roots without injury to them. When the soil is wet and heavy much of it is sure to drop from the plant in taking up, and with the soil will go the delicate feeding roots, that will remain uninjured if the change is made when the soil is dry. Transplant in a clear, warm day, make a hole sufficiently large to hold the roots without crowding, fill with water, put in the plant, fill the hole with earth, which will immediately become soft mud, press this firmly around the plant, and cover the surface with perfectly dry, fine earth, and the plant will never flag or droop, no matter how sunny or warm the day may be. The writer has practiced this plan for years and has never lost a plant, not even the most delicate subject.

It may be urged that this is not practicable in large fields where Cabbage or Tomato plants are to be set. But the best way is always the most practical, and it is much cheaper to devote a day to putting out plants and have them all live and thrive, than to put them out in half the time and have a large portion die and the remainder linger along only half alive. It should be considered, too, that men who work out in the rain are in too great haste to get through, to do their work well.

C. L. A.

Begonia gracilis, var. **Martiana.**—Mr. Pringle's note (page 7) upon the native habitat of this favorite old green-house plant is highly interesting, for the information he gives of its being found so far north quite accounts for the fact that it can be grown here, in England, in cool houses, where the artificial heat is just enough to keep frost out. Not long since I saw a raised brick bed in an orchard-house, with no heating pipes, quite over-run with the scaly tubers of this beautiful plant, which in bloom in a large mass had a charming effect. Mr. Sereno Watson may be interested in knowing that it has by no means gone out of cultivation here, but that it is one of the most cherished of green-house Begonias. In the Royal Horticultural Society's garden at Chiswick, it was a few years ago grown to great perfection as a pot plant. Another variety of *B. gracilis*, named *diversifolia*, is also in cultivation at Kew and elsewhere.

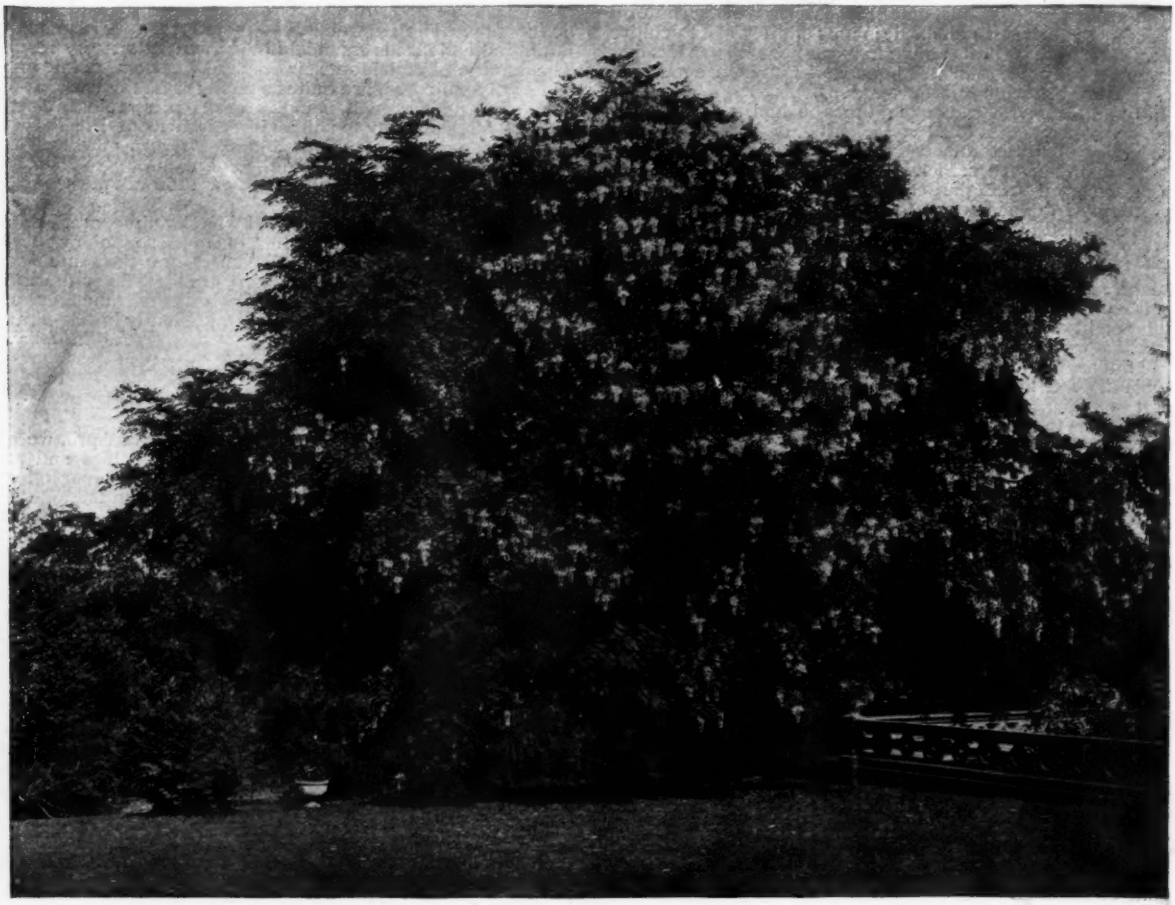

Fig. 17.—The Yellow wood.

Hardy Shrubs for Forcing.—To Mr. Falconer's list of shrubs (page 6), suitable for forcing into early flower, I should like to add a few, knowing that they are among the finest. The new *Prunus Pissardii*, or purple-leaved Plum, is the loveliest shrub imaginable when forced into early bloom, indeed it is naturally so precocious that it requires little or no artificial heat to bring out the flowers. Some bushes of it, four or five feet high, in the green-house at Kew, are mantled with white blossoms so profuse that the newly unfolded foliage is obscured. The flowers are about an inch across and have pink centres, while the new foliage, which at maturity is of a rich ruddy purple, is only slightly tinged with a vinous hue at flower time. This Plum may be lifted in autumn and potted for forcing, and taken into a slightly warmed green-house in February. Another first rate plant to force is Maule's Quince (*Pyrus*

Maulei), which has flowers like the common Japan Quince, but more orange in color—some call it orange red or orange scarlet. Small bushes of it, which are always very twiggy and spreading, have every shoot wreathed with bloom, which, in contrast to the pale green foliage, is admirable. This, too, requires very little forcing, but more than the purple-leaved Plum, because it naturally flowers later in the season. Waterer's Cherry (*Prunus Pseudo-Cerasus Watereri*) is matchless in its way when forced into bloom in March. The flowers are double and white, with just a suggestion of pink. A good plant of this in a conservatory or room lasts in bloom a long time, and in my opinion is very difficult to excel. *Forsythia suspensa*, and *F. Fortunei*, also force well, the plants hang like clouds of yellow bloom, if not unduly forced. The third week in March, onward, is not too early for them. *W. G.*

Consider the Lilies.—As soon as the weather will permit, and the ground becomes dry, examine Lilies planted in the fall, and where the frost has disturbed them make the soil firm by treading it down. All Lilies should be mulched in the fall, but if this was neglected it should be done at once. No better mulch can be used than equal parts of leaves and half-rotted chopped manure. It should be at least four inches deep. Such Lilies as *L. auratum*, *L. Wallacei*, *L. Leichtlini*, all forms of *L. speciosum*, and the species which flower after July, can be planted now with success, if it is done at once, and the bulbs are strong and plump. The top of the bulb should be three inches below the surface when the work is finished. Strong or green manure should not be used, rather plant with none; but if a compound of well-rotted manure and leaves can be had, use a spadeful for each bulb and mix it thoroughly with the soil. Plant firmly and mulch.

Peonies will be greatly benefited by a few forkfuls of manure placed around each plant. These gorgeous and easily cultivated flowers are fast growing in favor. Blooming as they do immediately after the first hint of summer weather, they should, in their season, hold as high a place in popular estimation as does the Chrysanthemum later in the year. *J. T.*

The Yellow-wood.

OUR illustration on page 92 represents a specimen of the Yellow-wood which grows in a garden near Boston. This tree is about forty years planted, and is thirty-five feet high, with a spread of branches of nearly sixty feet. Botanists know the Yellow-wood as *Cladrastis tinctoria*. The generic name *Cladrastis* is of rather obscure derivation, but the specific name relates to the wood, which yields a clear yellow dye. Originally this tree was erroneously referred to the genus *Virgilia* as *V. lutea*, and by that name it is still best known, and more often spoken of by cultivators than as *Cladrastis*, the name Virgilia being now often used as an English word in speaking of this tree. The Yellow-wood is one of the rarest trees in the North American forests. It grows only in a few isolated localities from middle Kentucky and Tennessee to the extreme south-western portions of North Carolina; and is found on rich hill-sides and on steep rocky river-bluffs. It was discovered by the elder Michaux, the French botanist, during one of his last journeys into the territory west of the Alleghanies, and was introduced into Europe late in the last century. Few trees are more beautiful at all seasons of the year; and few adapt themselves more rapidly to varied conditions of soil and climate, or are more thoroughly satisfactory in cultivation. The trunk of the Yellow-wood often divides near the base, or throws out large low branches, and while this habit renders it particularly beautiful as a lawn or ornamental tree, as our illustration shows, it increases the danger of old specimens splitting in the fork or losing their branches. This often occurs owing to their brittleness; and this is the only drawback to this tree in cultivation which has yet appeared. It is very hardy as far north as New England and grows rapidly in all soils and situations; although, like other deciduous trees, it needs deep, rich soil to bring out its greatest beauties. No insects prey upon its dark green, graceful foliage; its beautiful, long, pendulous racemes of pure white fragrant flowers appear in June when most other trees have passed their blooming period; and the clear yellow tints of the autumn foliage contrast pleasantly with the scarlets of Oaks and Maples. The Yellow-wood is a beautiful object in winter. The perfectly smooth, light-gray bark of its trunk and the delicacy of its branchlets recall the American Beech, which alone among our native trees excels it in these characters.

The wood of this tree has considerable value in addition to its value as a dye-wood, and if it could be obtained in sufficient quantities would find many uses. It is heavy and very hard, strong, close grained and susceptible of a good polish. Its color when first cut is bright, clear yellow, changing with exposure to light brown. At one time it was prized in Kentucky and Tennessee for gunstocks.

A second species of the genus *Cladrastis* is known (*C. Amurensis*), a small tree from Manchuria, with smooth brown bark and short spikes of small inconspicuous flowers. This tree is perfectly hardy in New England, where it flowers and ripens its fruit very freely. It is, however, inferior in every way to our American species as an ornamental tree, and is hardly worth cultivating except as a curiosity. *C. S. S.*

The Forest.

Influence of Undergrowth on the Increase of Timber.

WHILE we are talking of forestry as if it consisted simply in the planting of trees, or in preventing the lumberman from cutting wastefully, or in protecting the woods from fire, we are apt to overlook another much more positive and practicable object of forestry, which consists in making the most of our remaining natural growth, or in improving the young forest that nature provides after the virgin timber has been removed. In the Northwestern States especially there is a large area of second growth which is much inferior to what it might be, in kinds of timber, quality and fitness of crop. Here is where forestry should first be applied to fill out bare spots, to improve the crop, to make it grow more readily, to favor superior kinds, and so on. The whole theory of thinning should be carefully studied by holders of such forest property, for a dollar spent now in this direction may return manifold and earlier, than if nature is allowed to go on in her bungling ways.

While, theoretically, a tree with the full enjoyment of light would produce more leaves and therefore more wood than the one that is narrowed in by neighbors, on the other hand, the densely shaded soil offers more favorable conditions of growth than the open, bare or sodded ground. To balance these two factors of growth so as to produce an optimum is one object of forest management. The beneficial influence which undergrowth exerts upon the physical conditions of the forest soil, especially in preventing undue drying out by surface evaporation, is so well recognized, that the establishment of such undergrowth forms often an important part of forest management, for the beneficial influence upon the soil is naturally reflected in the prosperity of the principal growth.

The writer has seen a number of oaks some eighty years old which were left standing on a clearing to grow on for the next rotation, sickening and dying at the top. As soon as the young growth of hard wood underneath had covered up the foot of these oaks, they revived, recovered fully, and grew vigorously. Observance of these effects, of light on the crown and shade at the foot, has given rise to a management, by which, either a well grown forest is thinned out, leaving a certain number of trees to produce more quickly heavy sizes under the increased light influence and underplanting these for the purpose of preserving good soil conditions; or else, a naturally thin stand of trees may be so undergrown, in order to improve the production of the principal growth.

Such stands are not unfrequently found in Germany, where the villagers have tried to combine pasturage with tree-growth, mostly oak, by which the latter usually got the worst of it; the trees after a certain time showing no appreciable increase. The numerical result of this management may be seen from the following actual measurements.

In 1856 a stand of oaks then 130 years old, under which pasturage had been practiced, was thinned out and undergrown with beech, and last winter, thirty years after the operation, it was cut with the following results per acre:

a. Principal growth: 45 oaks, of 68 feet average height, yielding 3,320 cubic feet of solid wood, of which 2,082 cubic feet or 64 per cent. were over 6 inches in diameter, fit for

lumber or ties; the balance represents 13½ cords of firewood, of which 45 per cent. was split wood. In addition 11 cords of inferior brush wood were utilized.

b. The undergrowth of course yielded only firewood, altogether at the rate of 14 cords per acre, of which only 20 per cent. was a better class of wood. The total yield of wood per acre was, therefore, 4,765 cubic feet.

Measurements of average trees were then made at the height of 1 meter, 3 meters, 5 meters and 6 meters with regard to accretion, and the average increase in the area of the transverse cut expressed in per cent. was found as follows:

During		During		
2nd	1st	1st	2nd	3rd
Decade Before Undergrowing.		Decade After Undergrowing.		
1.02	1.11	1.82	1.78	1.58

The mass accretion expressed in per cent. moved as follows:

0.98	1.00	1.82	1.44	1.53

Now as the total cross section area—that is, the sum of the cross section areas of the forty-five oaks upon an acre—was found to be in the average 380 square feet, the absolute increase of this area in square feet during each decade was as follows:

3.88	4.22	6.92	6.76	6.00

Similarly of the 3,320 cubic feet of wood found at the time of cutting, the following masses in cubic feet are to be credited to each decade:

32.54	33.20	60.42	47.81	50.8

That is to say, as a consequence of the undergrowing there was visible a decided increase of wood production—2.70 square feet in cross section area and 27.22 cubic feet in mass; but this increased production was kept up during thirty years, so that the third decade furnished still 1.78 square feet and 17.6 cubic feet more than the decade before the undergrowing.

B. E. Fernow.

Professor H. M. Ward gives in *Nature* the following account of an experiment conducted by Professor Hartig:

"There is a plantation of Larches at Freising, near Münich, with young Beeches growing under the shade of the Larches. The latter are seventy years old, and are excellent trees in every way. About twenty years ago these Larches were deteriorating seriously, and were subsequently underplanted with Beech as foresters say—*i. e.*, Beech plants were introduced under the shade of the Larches. The recovery of the latter is remarkable, and dates from the period when the under-planting was made.

"The explanation is based on the observation that the fallen beech-leaves keep the soil covered, and protect it from being warmed too early in the spring by the heat of the sun's rays. This delays the spring growth of the Larches: their cambium is not awakened into renewed activity until three weeks or a month later than was previously the case, and hence they are not severely tried by the spring frosts, and the cambium is vigorously and continuously active from the first.

"But this is not all. The timber is much improved: the annual rings contain a smaller proportion of soft, light spring wood, and more of the desirable summer and autumn wood consisting of closely-packed, thick-walled elements. The explanation of this is that the spring growth is delayed until the weather and soil are warmer, and the young leaves in full activity; whence the cambium is better nourished from the first, and forms better tracheides throughout its whole active period."

Correspondence.

To the Editor of Garden and Forest,

Sir: I send you a short list of books and papers which influenced, or recorded, the beginnings of the modern art of landscape gardening.

The list is headed by Bacon's familiar Essay, in which some directions for the making of a wild garden are given; but long before Bacon there were plain signs of the coming of the day of naturalistic gardening. The poetry of Dante (1321) is full of sympathetic feeling for the beauty of the natural world—for meadows, woods, streams and flowers, even for the sea and the distant mountains. Petrarch, Boccaccio, Ariosto and Tasso betray no such fresh feeling for Nature as does their great predecessor. Yet in Tasso's "Jerusalem Delivered" (1595) is the following remarkable description of a garden scene:

"Everything that could be desired in gardens was presented to their eyes in one landscape, and yet without contradiction or confusion—flowers, fruits, water, sunny hills, descending woods, retreats into corners and grottoes—and what put the last loveliness upon the scene was that the art which did it was nowhere discernible. You might have supposed (so exquisitely was the wild and the cultivated united) that all had somehow happened, not been contrived. It seemed to be the art of Nature herself, as though in a fit of playfulness she had imitated her imitator."—(Leigh Hunt's translation.)

But it was in England that the love of Nature took firmest root. Chaucer (1400) and Spenser (1599) sang of the things of nature with a very fresh delight; and Milton, in the fourth book of "Paradise Lost," imagined a garden which was an Eden indeed.

England also raised up Shakespeare, whose love embraced the

> . . . . . "daffodils
> That come before the swallow dares, and take
> The winds of March with beauty;"

and Cowley, whose delight was that characteristic one for an Englishman, "a small house and a large garden"; and, later, Thomson, Cowper, Gray, and Wordsworth.

Meanwhile the art of landscape painting had been growing up. Titian, its founder, composed the first landscapes upon canvas in the days when Tasso was imagining the garden of Armida; Claude Lorraine, Salvator Rosa and Poussin were contemporaries of John Milton.

Well might Wordsworth write (1805) to Sir George Beaumont: "Painters and poets have had the credit of being reckoned the fathers of English gardening"; and he adds, "they will also have, hereafter, the better praise of being fathers of a better taste."

"Bacon was the prophet, Milton the herald, of modern gardening; and Addison, Pope and Kent the champions of true taste"—thus the Rev. William Mason in 1772, when the sort of landscape-beauty long imagined by the poets was beginning to be realized in the English parks. Addison and Pope, each, in his few acres, practiced what he preached—Addison at Bilton near Rugby, Pope at Twickenham near London. Bridgeman, a professional gardener of the period, is said to have been converted by Pope's paper in the *Guardian*, and thenceforth to have abandoned the clipping of trees; while Kent, a painter, gave up his art to become the first landscape gardener.

The first complete treatise on the new art was Whateley's still indispensable "Observations," published in 1770, and immediately translated into French and German. A few years later appeared Girardin's excellent French work, and Hirschfeld's six volumes printed in German and French. Later came Gilpin's delightful accounts of his English tours, which had great influence in waking the popular interest in natural scenery, and Knight's and Price's vigorous attacks on the smooth monotony which characterized the landscape work of Brown and his imitators.

Shenstone, Whateley, Girardin, Walpole, Knight, Price and Laborde, all worked out their ideas on their own estates; and it is interesting to know that Rousseau, the contemporary of Gray, who yet was the first modern Continental author to write feelingly of natural scenery, was a frequent guest of Girardin's at his Ermenonville.

To close the list we have the writings of a few of the first landscape gardeners themselves—Repton and Loudon for England, Viart and Thouin for France, Sckell and Pückler-Muskau for Germany.

Mr. Editor, I hope to see printed in Garden and Forest numerous extracts chosen from these books. I am sure you can do us Americans no better service than thus to advance "the better praise" of the founders of the art and their principles. I am, sir, yours respectfully,

Boston, 1st March, 1888. *Charles Eliot.*

A List of Books on Landscape Gardening.

1625. Francis Bacon, Lord Verulam.—"On Gardens," one of his "Essayes or Counsels Civill and Morall."

1712. Joseph Addison, essayist, Secretary of State.—"On the Causes of the Pleasures of the Imagination arising from the works of Nature, and their superiority over those of Art." In *The Spectator*, No. 414.—"A Description of a Garden in the Natural Style." In *The Spectator*, No. 477.

1713. Alexander Pope, poet and essayist.—On Verdant Sculpture. In *The Guardian*, No. 173.

1731. ——— ———.—"An Epistle to the Right Honourable Richard, Earl of Burlington." London, fol.

1764. William Shenstone, poet and essayist.—"Unconnected Thoughts on Gardening." In his collected works. London, 8vo.

1768. GEORGE MASON, "a classical scholar and critic."—"An Essay on Design in Gardening." London, 8vo.—An enlarged edition, 1795. London, 8vo.

1770. THOMAS WHATELY, Secretary to the Earl of Suffolk.—"Observations on Modern Gardening, illustrated by Descriptions." London, 8vo.

1772. Rev. WILLIAM MASON, poet, Canon of York.—"The English Garden: A Poem in four books." London, 4to.—A new edition, 1785. London, 8vo.

1773. CH. CAI. L. HIRSCHFELD, "counselor to his Danish Majesty, Professor of the Fine Arts at Kiel."—"Ammerkungen über Landhaüser und Gartenkunst." Leipsig, 12mo.

1774. CLAUDE HENRI WATELET, Receiver-General of Finance, Member of the Academy of Sciences.—"Essai sur les Jardins." Paris: 8vo.

1774. Sir WILLIAM CHAMBERS, F.R.S., architect.—"Dissertations on Oriental Gardening." London, 4to.

1776. J. M. MOREL, architecte.—"Théorie des Jardins, ou l'Art des Jardins de la Nature." Paris.

1777. L. R. GIRARDIN, Vicomte d'Ermenonville.—"La Composition des Paysages sur le terrain, etc." Geneva: 8vo.

1777. CH. CAI. L. HIRSCHFELD.—"Theorie der Gartenkunst." Leipsig: 6 vols., 4to.

1780. HORACE WALPOLE, Earl of Orford.—"On Modern Gardening." In his "Anecdotes of Painting."

1783. DANIEL MALTHUS.—An Introduction to a Translation of Girardin's "Essay on Landscape." London, 8vo.

1783–1809. Rev. WILLIAM GILPIN, M.A.—"Observations relative chiefly to Picturesque Beauty" in many parts of Great Britain. London, 8 vols., 8vo.

1785. WILLIAM MARSHALL, estate agent.—"Planting and Rural Ornament." London, 8vo.—A second edition in 2 vols., 1796. London, 8vo.

1791. Rev. WILLIAM GILPIN.—"Remarks on Forest Scenery, etc." London, 2 vols., 8vo.

1792. ——— ———.—"Three Essays: On Picturesque Beauty, On Picturesque Travel, On Sketching Landscape, etc." London, 8vo.

1794. RICHARD PAYNE KNIGHT, "a gentleman of great classical attainments."—"The Landscape: A didactic poem." London, 4to.

1794. Sir UVEDALE PRICE, "a gentleman and scholar of great taste, who has greatly improved and beautified his own estate."—"An Essay on the Picturesque, etc." London, 8vo.

1794. HUMPHREY REPTON, landscape gardener.—"Letter to Uvedale Price, Esq., on Landscape Gardening." London, 4to.

1795. ——— ———.—"Sketches and Hints on Landscape Gardening, etc." London, fol.

1803. ——— ———.—"Observations on the Theory and Practice of Landscape Gardening, etc." London, 4to.

1803. JOHN CLAUDIUS LOUDON, landscape gardener.—"Observations on laying out the Public Squares of London." In *The Literary Journal.*

1804. ——— ———.—"Observations on the Theory and Practice of Landscape Gardening, etc." Edinburgh: 8vo.

1806. ——— ———.—"A Treatise on forming, improving and managing Country Residences." London, 2 vols., 4to.

1808. ALEXANDRE LOUIS JOSEPH, Comte de Laborde.—"Descriptions des Nouveaux Jardins de la France." Paris: folio.

1812. JOHN CLAUDIUS LOUDON.—"Hints on the Formation of Gardens and Pleasure Grounds." London, 4to.

1818. F. L. VON SCKELL, landschafts-gärtner.—"Beitrage sur bildenden Gartenkunst." Munich: 8vo.

1819. GABRIEL THOUIN, architecte-paysagiste.—"Plans raisonnés de toutes les Espèces de Jardins." Paris: folio.

1819. ——— VIART, architecte-paysagiste.—"Le Jardiniste Moderne, etc." Paris: 12mo.

1822. JOHN CLAUDIUS LOUDON.—"An Encyclopædia of Gardening, etc." London, 8vo.

1832. WM. S. GILPIN.—"Practical hints on Landscape Gardening."

1834. FÜRST HERMANN LUDWIG HEINRICH VON PÜCKLER-MUSKAU.—"Andeutungen über Landschafts-gärtnerei." Stuttgart: folio.

Periodical Literature.

THE first Lime Tree on the great avenue called *Unter den Linden*, in Berlin, was planted in 1680, the first house having been built three years before. The story of this first planting and of those which have since been made is told by Herr Rodenberg in the *Deutsche Rundschau* for November, 1887; and in subsequent numbers of the magazine he has outlined the history of the famous street which has witnessed so many striking political and social scenes.

The title of an article by Lord Fortescue in the March number of the *Nineteenth Century* will doubtless attract the eye of many who are interested in the development of a love for flowers among the poor. But upon examination "Poor Men's Gardens" proves to be simply a treatise upon the question, much discussed of late in England, of the advisability of letting to members of the laboring classes "allotments" of ground at a distance from their homes, by the cultivation of which they may add to the food supply of their families.

The great and ancient Forest of Fontainebleau has been made famous all over the world by the genius of the band of landscape painters who, in the last generation, devoted their lives to depicting its venerable Oaks, its heathy glades, its melancholy pools and its huge groups of moss-grown rocks. All who know and admire the pictures of Rousseau, and Diaz and Dupré, and of a host of later comers who have followed in their traces—and the number must be legion in America—will be interested to read an account of the Forest of Fontainebleau written by Mr. J. Penderel-Brodhurst and published in recent numbers of the *Magazine of Art.* And even to those whom no artistic magnet has attracted to this forest, these articles will be attractive; for by describing the scenes of humble life which, winter and summer, are busily enacted beneath the Oaks of Fontainebleau, the difference between what is meant in Europe by a forest and what is meant by one in America, is vividly set forth.

In *Chambers' Journal* for February will be found a brightly written, yet instructive article called "Early Blossoms." The chief flowers of which the author speaks are Snowdrops and Crocuses, giving us at some length the history of their introduction into European gardens, speaking especially of the species of Crocus which furnishes the saffron of commerce, and describing the singular vicissitudes of public favor and disfavor which this substance has undergone.

The *Popular Science Monthly* for April contains an attractive and instructive chapter on "Californian Dry Winter Flowers," by Professor Byron D. Halsted. It gives an account of observations made in the vicinities of Los Angelos and Santa Barbara in the winter of 1886–'87, when the rainy season was unusually late, and the plants which were in bloom had received no rain for nearly ten months. In view of this fact, it is surprising to read the long list of such plants—plants "which grow without irrigation, and blossom from the dust"—and to note how many of them belong to genera whose eastern representatives flourish only under very different conditions. Excluding the garden flowers of which, if he will but supply a little water, the Californian may have "the whole list in mid-winter," Professor Halsted pronounces the most attractive flowers he found to be those of the phlox-like *Gilia Californica.* "This shrub is two or three feet high, and grows upon dry hill-sides. The leaves are thickly set and villous, while the stems are terminated by clusters of rose or lilac-colored flowers an inch or more across the limb. The fragrance is indescribably rich when not too profuse." This plant is locally called the "Mountain Pink," and next to it in attractiveness, the author ranks the *Hosackia glabra,* of the order Leguminosæ, a shrub with long decumbent stems and yellow and brown flowers.

The most interesting article for lovers of nature in the recently completed eighty-third volume of the *Revue des Deux Mondes* is Monsieur Th. Bentzon's "Le Naturalisme aux Etats-Unis," the exact bearing of which is more clearly defined by the sub-title "La Bibliothèque du Plein Air." Monsieur Bentzon—who, by the way, is a lady, writing under an assumed name, with a special predilection for American literature—reviews in this article, at considerable length and with high praise, the volumes contained in Messrs. Houghton, Mifflin & Co.'s "Out-door Library"—the works of Thoreau and John Burroughs, Lowell's "My Garden Acquaintance," and Miss Jewett's "White Heron," and speaks incidentally of the Journals of Agassiz and his wife, and of poems and stories by many other hands. The genesis of this out-door literature is traced, no doubt with much reason, largely to the combined influence of Agassiz's teachings and of Emerson's "Nature," and its development is looked upon as the effect, less of the wish for scientific knowledge than of the desire, on the one hand, to give literary outlet to the "animal spirits" of a young and vigorous race, and, on the other, of the Emersonian wish to trace the relationship between the soul of man and the soul of nature. We ourselves hardly realize, perhaps, how strongly the love for nature is expressing itself in our current literature. It is doubly pleasant, therefore, to find the fact recognized

abroad, where the American people is too often believed to be wholly given over to money-making industries, and as entirely devoid of the contemplative as of the poetic gift. There is one author, however, whom one regrets to find missing from M. Bentzon's list—Miss Murfree (Charles Egbert Craddock), whose pictures of nature in the mountains of the south-west deserve to be ranked with our best out-door poems in prose.

An article on "An Old-Fashioned Garden" by Mrs. A. M. Crompton in *Harper's Young People* for March 27th, is of just the sort which should frequently be written for youthful readers. Not often will any one be able to realize just "The garden of my dreams" as this author describes it—for it is described as one "which must be at least a hundred years old," and in which, though successive owners may have worked many alterations, at least "the trees and turf must have the beauty of age." But a garden where beauty means growing things in natural development and not an assemblage of statues and fountains and stiff showy pattern beds, where "old-fashioned" sweet-scented flowers bloom in abundance and birds delight to gather, where vines and creeping plants are trained with "an art that conceals art," where fruit-trees, shade-trees, shrubs and annuals all have their place and purpose, and where winter may seem almost as beautiful as summer—such a garden as this very many more people might have than is to-day the case. And it is difficult to believe that a strong desire for it will not be inspired by this charming little article.

Notes.

Plants bearing exclusively what purport to be four-leaved Clovers—or, as the Germans call them, "luck Clovers"—are sold just now in pots in the flower markets of Germany. They are said, however, not to be true Clovers (*Trifolium*), but certain species of *Oxalis*, which regularly produce leaves with four leaflets—*O. occulenta*, *O. Deppei*, or *O. tetraphylla*.

Herr Max Leichtlin has commissioned Paul Tintenis to travel for him in Armenia in order to collect bulbs and seeds for cultivation in the famous Leichtlin gardens at Baden. An herbarium will also be collected, illustrative of the Flora of Armenia.

A great Fruit Exhibition will be held in Vienna during the coming autumn, with the object not only of displaying the pomological products of Austria, but of increasing, among cultivators and the public, a knowledge of the newest methods of cultivating, preserving and utilizing fruits.

The Royal Society of Agriculture and Botany will hold its twelfth annual international exhibition during the latter part of this month.

A Horticultural Congress will be held in Paris in May, in conjunction with the annual flower show of the National Horticultural Society.

The fiftieth anniversary of the founding of the Horticultural Society "Hortensia" will be celebrated in Munich in July.

The Philadelphia Flower Show.

THE Spring Exhibition at Philadelphia last week fully sustained, in the quality of the collection, the high reputation won by the Pennsylvania Horticultural Society during its long and successful career. The number of plants and flowers displayed was smaller than usual, but this relieved the managers from any temptation to crowd them, and the arrangement throughout was admirable. The centre piece, with a cone of *Asparagus tenuissimus* rising from a bank of rich flowers and foliage to the high ceiling, was tastefully conceived, and no single feature of it was more pleasing than the immense Fuchsia, six feet high, with its wealth of bloom. It was a general remark that exhibitors could in no way do more to render flower shows attractive than by displaying finely-developed specimens of plants that are well known and "common." For some reason Orchids have not been cultivated as largely in the neighborhood of Philadelphia as they have been in other parts of the country. The fine display of these plants was therefore a surprise. The group of fifty plants from the collection of Mr. W. S. Kimball, of Rochester, New York, was especially noteworthy, every plant being well grown and in fine flower. Good collections were also shown by Siebrecht & Wadley, of New York, and Charles Dissel, of Philadelphia. Of course the spring flowering bulbs were abundantly displayed, and the hall was bright with Rhododendrons and Azaleas. But Roses, next to the Orchids, attracted the most attention. The flowers of Mrs. John Laing were unusually fine, and this variety did not suffer by comparison with Madame Gabriel Luizet as they were seen together. No better Brides were ever exhibited, and Niphetos was almost as good. A cluster of General Jacqueminots from Boston were admired for their unusual size and the luxuriance of their foliage. Besides the old favorites, a prize was awarded to a Tea Rose called, provisionally, The Gem. No one was able to tell whether it was an old variety, revived by chance, or a sport. But its size, form and solidity give it great value. It is not a pure white, but has a pleasing suggestion of the faintest cream color, and the growers present agreed that it was a Rose of the greatest promise.

Retail Flower Markets.

NEW YORK, *April 13th.*

The stock of cut flowers is very heavy; so heavy indeed that only the choicest blossoms bring anything like a satisfactory price. Trade is good on the chief thoroughfares, but is generally dull on East-side avenues. A few large weddings have brought orders for handsome designs for gifts, but the average demand is for flowers not selected. Paul Neyron and Baroness Rothschild Roses are particularly handsome. They bring 75 cts. each. Other hybrids of good quality cost 50 cts. Some very large La France Roses bring 60 cts. each. Catherine Mermets are poor, and Brides are showing considerable color on the outer petals. There is a glut of Callas and Harris's Lilies; the former are offered for 15 and 20 cts., and the latter for 25 and 30 cts. Lilac from New Jersey is very well grown and holds its price at 50 cts. a spray. Poet's Narcissus is scarce, and costs 50 cts. a dozen. Hyacinths, Tulips and Lilies-of-the-Valley cost from 60 to 75 cts. a dozen, according to quality. Very choice Lilies-of-the-Valley selected for bridal bunches, are sold for $1 a dozen. Daffodils cost from 60 to 75 cts. a dozen. White Carnations are scarce, but those of other colors are plentiful and 50 cts. a dozen. Short-stemmed Carnations are sold for 30 cts. a dozen. Small Mignonette costs 25 cts. a dozen spikes. The large Spiral brings 10 cts., and the Giant holds at 15 cts. a spike. Forget-me-not of excellent quality appears, and costs 50 cts. a dozen sprays. Some Heliotrope of great beauty is in market, bringing 25 cts. a bunch. Other flowers, if of good quality, remain as last quoted. There is no price set upon the indifferent stock which gluts the market. It may be bought for any sum offered.

PHILADELPHIA, *April 13th.*

Roses are quite plentiful now, and the Hybrids are generally very fine. Magna Charta and Baroness Rothschilds are selling freely at from $4 to $6 per dozen. Mrs. John Laing is improving very much in quality, as also is Puritan and American Beauty. Amongst the Tea varieties, Madame Cuisin was in remarkable demand this week; one of the leading florists had difficulty in getting sufficient stock to fill his orders. It is a beautiful Rose, and not the least of its good qualities is the length of time it keeps in good condition. With brighter sunshine it becomes higher in color. Lilacs are still scarce, and much called for; very little is forced for cut blooms in the vicinity of this city. The beautiful single Daffodil is becoming more abundant, many coming from the warmer counties of New Jersey and Delaware. Some varieties of Carnations are improving in quality, notably Grace Wilder, a great favorite here. The delicate pink coloring is more decided than it is in the dark days of winter. It sells readily at from 50 cts. to 75 cts. per dozen. Buttercup is also very good, and in demand, selling at from 35 cts. to 50 cts. per dozen. Wedding breakfasts are growing in favor. Flowers are used on such occasions in great abundance.

BOSTON, *April 13th.*

On Monday last one of the leading dry goods firms created a sensation in the flower market by buying up all the Violets that could be obtained for that day and presenting them to their customers. The stock of Violets lasted only till noon, however, and the merchants were then obliged to fall back on Roses as a substitute, and the market was completely cleaned for once. A general adoption of this plan would not be unacceptable to the flower growers and flower dealers at present, for there is an overstock of flowers in almost every variety. Roses are particularly abundant yet, in spite of the low prices. Specially fine specimens of any popular variety still command customers at high figures. Some remarkable Jacqueminots bring $4 to $5 per dozen, and at the same time those of ordinary quality can be bought as low as $1.50 per dozen, and a still lower grade is eagerly bought from the street boys at "three for a quarter." Catherine Mermets, Perles, Bennetts and Brides are all of first quality, and well worth the low price—about $1.50 per dozen—asked for them. There is an abundance of Lilies-of-the-Valley, Tulips and Poet's Narcissus at $1 per dozen. The yellow varieties of Narcissus are about gone for this season. Violets are 50 cts. per bunch and long-stemmed Carnations 50 cts. per dozen. White Lilies are still abundant in the market and they are used largely in the making up of funeral designs. Heath has disappeared completely, and but few Orchids are seen. Smilax continues very scarce and brings 50 cts. per yard readily. Some superb Hydrangea plants are to be seen in the florists' windows. These, with Canary Broom, "Longiflorum" Lilies and Cinerarias, are very popular as window plants this season. The Amaryllis is also growing in favor, and deservedly so, for it is easily grown and makes a striking display.